

What is claimed is:

1. A process for the creation of a metal interconnect over a layer of adhesion material and a layer of barrier material having a thickness, comprising:

providing a substrate, the substrate having been provided with at least one point of electrical contact in or over the surface thereof, a patterned layer of Anti Reflective Coating (ARC) having been deposited over at least one point of electrical contact;

depositing a layer of dielectric over the substrate, including the surface of the patterned layer of Anti Reflective Coating (ARC);

patterning and etching the layer of dielectric, creating at least one opening there-through and through said layer of ARC, exposing and further interacting with the at least one point of electrical contact;

depositing a layer of adhesion material over the layer of dielectric, including inside surfaces of the at least one opening;

depositing a layer of barrier material over the layer of adhesion material, the layer of barrier material comprising a first or lower and a second or upper layer of barrier material separated by a central layer of adhesion material;

depositing a layer of conductive material over the layer of barrier material, filling the at least one opening; and

removing excess material from the layer of dielectric.

2. The method of claim 1, the at least one point of electrical contact comprising aluminum.

3. The method of claim 1, the adhesion material comprising Ti.

4. The method of claim 1, the barrier material comprising TiN.

5. The method of claim 1, the central adhesion material separating the first or lower layer of barrier material from the second or upper layer of barrier material having a thickness between about 10 and 50 Angstroms.

6. The method of claim 1, the conductive material comprising tungsten.

7. The method of claim 1, the first or lower layer of barrier material having a thickness between about 0.40 and 0.60 of a thickness of a layer of barrier material.

8. The method of claim 1, the second or upper layer of barrier material having a thickness between about 0.40 and 0.60 of a thickness of a layer of barrier material.

9. The method of claim 1, the first layer of barrier material having a thickness between about 100 and 175 Angstrom.

10. The method of claim 1, the second layer of barrier material having a thickness between about 90 and 125 Angstrom.

11. A process for the creation of a metal interconnect over a layer of glue material and a layer of barrier material having a thickness, comprising:

providing a substrate, the substrate having been provided with at least one point of electrical contact in or over the surface thereof, said at least one point of electrical contact being covered with a layer of Anti Reflective Coating (ARC), a patterned layer of dielectric having been deposited over the substrate having at least one opening there-through and through said layer of ARC being aligned with at least one point of electrical contact, said opening exposing and causing gauging of the at least one point of electrical contact;

depositing a first layer of adhesion material over the layer of dielectric, including inside surfaces of the at least one opening;

depositing a first layer of barrier material over the first layer of adhesion material to a thickness being equal to between about 0.40 and 0.60 of a thickness of a layer of barrier material;

depositing a second layer of adhesion material over the first layer of barrier material;

depositing a second layer of barrier material over the second layer of adhesion material to a thickness being equal to between about 0.40 and 0.60 of a thickness of a layer of barrier material;

depositing a layer of conductive material over the second layer of barrier material, filling the at least one opening; and

removing excess material from the surface of the layer of dielectric.

12. The method of claim 11, the at least one point of electrical contact comprising aluminum.

13. The method of claim 11, the first and second layer of adhesion material comprising Ti.

14. The method of claim 11, the first and second layer of barrier material comprising TiN.

15. The method of claim 11, the second layer of adhesion material being deposited to a thickness between about 10 and 50 Angstroms.

16. The method of claim 11, the conductive material comprising tungsten.

17. The method of claim 11, the thickness of the layer of barrier material being between about 200 and 350 Angstrom.

18. The method of claim 11, the thickness of the first layer of barrier material being between about 100 and 175 Angstrom.

19. The method of claim 11, the thickness of the second layer of barrier material being between about 90 and 125 Angstrom.

20. A process for the creation of a metal interconnect over a layer of glue material and a layer of barrier material having a thickness, comprising:

providing a substrate, the substrate having been provided with at least one point of electrical contact in or over the surface thereof, said at least one point of electrical contact

being covered with a layer of Anti Reflective Coating, at least one opening having been created through a layer of dielectric deposited over the substrate aligned with said at least one point of electrical contact, said at least one opening further penetrating the layer of ARC, exposing and gauging the at least one point of electrical contact;

depositing a first layer of Ti over the layer of dielectric, including inside surfaces of the at least one opening;

depositing a first layer of TiN over the first layer of adhesion material to a thickness being equal to between about 0.40 and 0.60 of a thickness of a layer of barrier material;

depositing a second layer of Ti material over the first layer of barrier material;

depositing a second layer of TiN over the second layer of adhesion material to a thickness being equal to between about 0.40 and 0.60 of a thickness of a layer of barrier material;

depositing a layer of conductive material over the second layer of barrier material, filling the at least one opening; and

removing excess material from the surface of the layer of dielectric.

21. The method of claim 20, the at least one point of electrical contact comprising aluminum.

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22. The method of claim 20, the second layer of adhesion material being deposited to a thickness between about 10 and 50 Angstroms.

23. The method of claim 20, the conductive material comprising tungsten.

24. The method of claim 20, the thickness of a layer of barrier material being between about 200 and 350 Angstrom.

25. The method of claim 20, the thickness of the first layer of Ti being between about 100 and 200 Angstrom.

26. The method of claim 20, the thickness of the first layer of TiN being between about 100 and 175 Angstrom.

27. The method of claim 20, the thickness of the second layer of TiN being between about 90 and 125 Angstrom.

28. A metal interconnect over a layer of adhesion material and a layer of barrier material having a thickness, comprising:

a substrate, the substrate having been provided with at least one point of electrical contact in or over the surface thereof, a layer of ARC having been provided over the at least one point of electrical contact, at least one opening having been

created through a layer of dielectric aligned with the at least one point of electrical contact, said at least one opening penetrating the layer of ARC exposing and gauging the at least one point of electrical contact;

a layer of adhesion material over inside surfaces of the at least one opening;

a layer of barrier material over the layer of adhesion material, the layer of barrier material comprising a first or lower layer of barrier material and a second or upper layer of barrier material separated by a central layer of adhesion material; and

a layer of conductive material over the layer of barrier material, filling the at least one opening.

29. The metal interconnect of claim 28, the at least one point of electrical contact comprising aluminum.

30. The metal interconnect of claim 28, the adhesion material comprising Ti.

31. The metal interconnect of claim 28, the barrier material comprising TiN.



32. The metal interconnect of claim 28, the adhesion material separating the first or lower layer of barrier material from the second or upper layer of barrier material having a thickness between about 10 and 100 Angstroms.

33. The metal interconnect of claim 28, the conductive material comprising tungsten.

34. The metal interconnect of claim 28, the first or lower layer of barrier material having a thickness being equal to between about 0.40 and 0.60 of the thickness of the layer of barrier material.

35. The metal interconnect of claim 28, the second or upper layer of barrier material having a thickness being equal to between about 0.40 and 0.60 of the thickness of the layer of barrier material.

36. A tungsten interconnect over a layer of glue material and a layer of barrier material having a thickness, comprising:

a substrate, the substrate having been provided with at least one point of electrical contact in or over the surface thereof, a patterned layer of ARC having been provided over the at least one point of electrical contact, at least one opening

aligned with the at least one point of electrical contact having been created through a layer of dielectric deposited over the substrate, said at least one opening penetrating said patterned layer of ARC, exposing and gauging said patterned at least one point of electrical contact;

a first layer of Ti deposited over sidewalls of the at least one opening;

a first layer of deposited TiN over the first layer of Ti to a thickness being equal to between about 0.40 and 0.60 of a thickness of a layer of barrier material;

a second layer of Ti deposited over the first layer of TiN;

a second layer of TiN deposited over the second layer of Ti to a thickness being equal to between about 0.40 and 0.60 of a thickness of a layer of barrier material; and

a layer of tungsten deposited over the second layer of TiN, filling the at least one opening.

37. The tungsten interconnect of claim 36, the at least one point of electrical contact comprising aluminum.

38. The tungsten interconnect of claim 36, the second layer of Ti having a thickness between about 10 and 50 Angstroms.

39. A glue/barrier layer interposed between a metal interconnect created though an opening is a dielectric, comprising:

a layer of adhesion material over the layer of dielectric, including inside surfaces of the opening;

a layer of barrier material over the layer of adhesion material, the layer of barrier material comprising a first or lower and a second or upper layer of barrier material separated by a central layer of adhesion material.

40. The glue/barrier layer of claim 39, the adhesion material comprising Ti.

41. The glue/barrier layer of claim 39, the barrier material comprising TiN.

42. The glue/barrier layer of claim 39, the central layer of adhesion material separating the first or lower layer of barrier material from the second or upper layer of barrier material having a thickness between about 10 and 100 Angstroms.

43. The glue/barrier layer of claim 39, the metal interconnect comprising tungsten.

44. The glue/barrier layer of claim 39, the first or lower layer of barrier material having a thickness being equal to between about 0.40 and 0.60 of a thickness of a layer of barrier material.

45. The glue/barrier layer of claim 39, the second or upper layer of barrier material having a thickness being equal to between about 0.40 and 0.60 of a thickness of a layer of barrier material.